7Sci MASTER Doc Spartan PRIDE

7Sci	#	#	#	#	#	#	#	#	#	#
Name										

Quia.com

Username Password

Students are NOT allowed to go into the lab area unless directed to do so !!!

PASTE NEW @ TOP - under this black row ## TYPE YOUR ANSWERS in RED TEXT

PHET Greenhouse Effect PHET Balloon Static Electricity PHET Play Skate Park

8.5 - Light

How to get 2000ºF Solar Power << Watch the King of Random video

Note: A fresnel lenses increase the amount of sun striking an object with a concentration ratio of around 500:1. If everyone completes the questions, Mr. Gruis has a salvaged fresnel lens which the class can hopefully use for a quick demonstration.

Solar heat ray lens from TV melts rock into lava then glass

1. Where did he get the large fresnel lens?
   a.
2. Where on the TV was the lens?
   a.
3. The large fresnel lens can focus sunlight to a single small point, and can generate temperatures over __?__ degrees Fahrenheit.
4. Describe what he did with the pure glass focusing lens.
   a.

(text) Questions from lesson 5, Topic 8: Waves & Electromagnetic Radiation

1. Define transparent.
   a.
2. Define translucent.
   a.
3. Define opaque.
   a.
4. When the sun shines on a white surface ALL / NO light is reflected.
5. When the sun shines on a black surface ALL / NO light is reflected.
6. Describe how the answers to 4 & 5 impact the amount of solar energy reflected back to the atmosphere as snow and ice melt and become ocean water.
   a.
7. Describe a convex mirror.
   a.
8. Describe a concave mirror.
   a.

8.43 - Electromagnetism

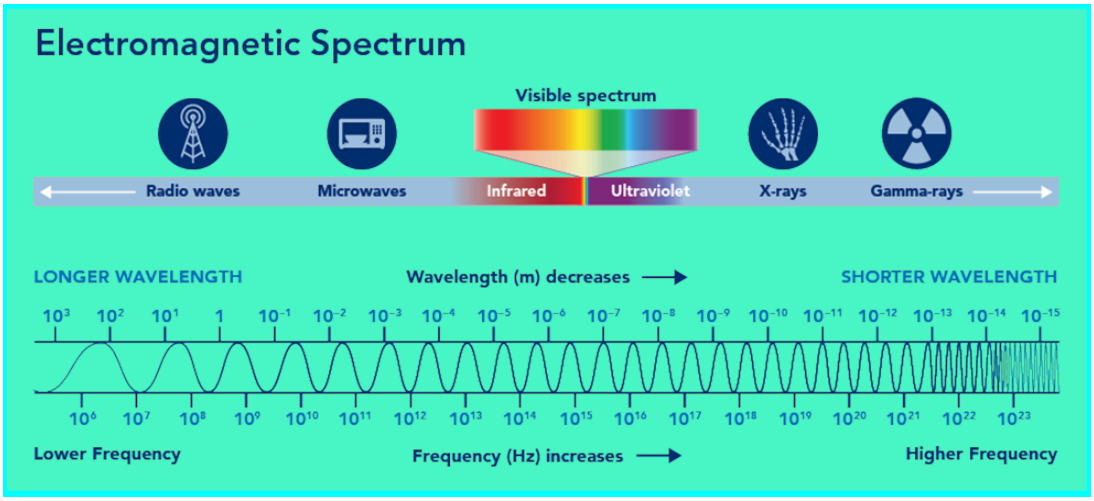
Electromagnetism 101 | National Geographic << watch video to answer questions

1. List the 4 fundamental forces of nature:
    a.
    b.
    c.
    d.
2. Electromagnetism is a branch of physics which studies the interactions between _____ and _____ fields.
3. All _____ has an electric charge, positive, negative or zero (neutral).
4. _____ charges attract, while _____ charges repel.
5. These electric forces bring and hold _____ together.
6. When atoms gain or lose electrons (electrons have a negative charge) a measurable electric _____ will form.
7. If electrically charged particles start to move, the field will become a flowing electric _____.
8. An electromagnetic field transmits _____ of electromagnetic energy or _____ into space.
9. The intensity of this radiation is determined by its _____.
10. Near the middle of the electromagnetic spectrum is _____ light.
11. On either side of visible light are _____ electromagnetic waves. On one end are long, low-frequency _____ waves that broadcast television signals , _____ that cook food, and _____ waves emitted by fires.
12. On the other side are short, high-frequency wavelengths: _____ , x-rays, and gamma radiation. These waves can pass through the human body.
13. Thousands of miles below Earth's surface, a layer of liquid _____ churn and flow. This produces electric currents which then produce _____ fields which are called a _____.
14. Earth's poles attain _____ and _____ charges turning the planet into a giant electromagnet.

8.42 - Amazing Water & Sound trick - what's the secret?

1. Describe why the water moves the way it moves in this experiment.
    a.

8.41 - Electromagnetic Spectrum



1. **Radio Waves:** Shorter / Longer Wavelength & Lower / Higher Frequency **THAN VISIBLE LIGHT.**

2. **Microwaves:** Shorter / Longer Wavelength & Lower / Higher Frequency **THAN VISIBLE LIGHT.**
3. **Infrared Waves:** Shorter / Longer Wavelength & Lower / Higher Frequency **THAN VISIBLE LIGHT.**
4. **X-ray:** Shorter / Longer Wavelength & Lower / Higher Frequency **THAN VISIBLE LIGHT.**
5. **Gamma Rays:** Shorter / Longer Wavelength & Lower / Higher Frequency **THAN VISIBLE LIGHT.**

8.4 - Electromagnetic Waves (text)

(62) Electromagnetic Waves - YouTube 4 min.

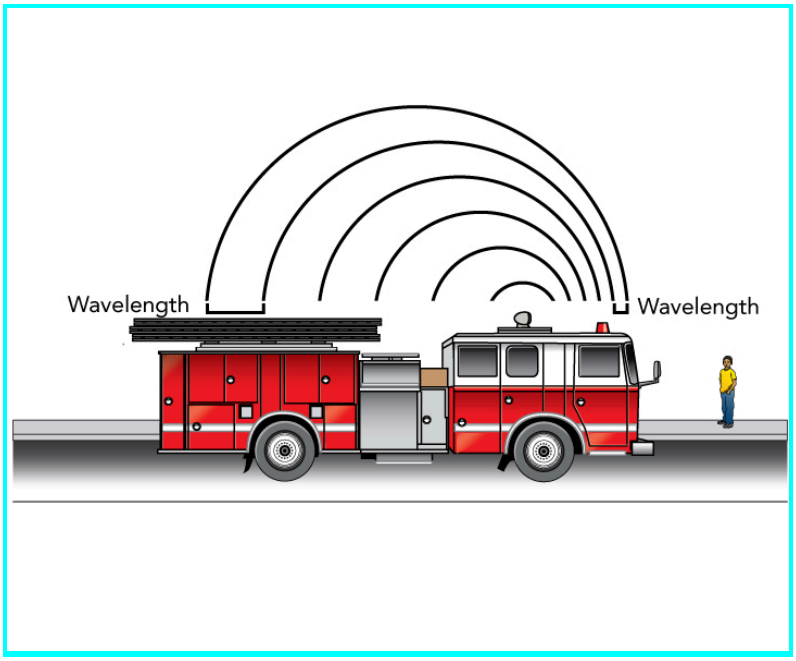
1. An electromagnetic wave is a wave made of a combination of changing ____ field and a changing ____ field.
2. Electromagnetic waves do NOT require a ____ such as air, so they can transfer energy through a vacuum.
3. ____ is a technology that uses microwaves, a type of electromagnetic wave, to detect objects in the atmosphere.
4. Visual light
5. A polarizing filter acts as though it has tiny ____ aligned in only one direction. Polarized sunglasses block out some ____ of light so that your eyes are NOT exposed to as much radiation.
6. The photoelectric effect can be explained by thinking of light as a stream of tiny packets of ____ instead of as a wave.
7. The electromagnetic spectrum is the complete range of electromagnetic waves placed in order of increasing ____.
8. Electromagnetic waves with the longest wavelengths and the lowest frequencies are ____ waves.
9. Microwaves have shorter wavelengths and higher ____ than radio waves.
10. If you turn on an electric stove's burner, you can feel it warm up before the heating element starts to glow. The invisible heat you feel is ____ radiation.
11. Electromagnetic waves that you can see are called ____ light.
12. Gamma rays have the shortest wavelengths and highest frequencies, and have the greatest amount of ____ of all of the electromagnetic waves.

8.31 - Sound Waves Crash Course

(62) Sound: Crash Course Physics #18 - YouTube

1. Sound is a ____ wave, like the Slinky P-wave.
2. When your cell phone receives a 'ding', the phone's ____ vibrates to make the ding.
3. Movement of particles in the air is called a ____ wave, by moving particles in the air, sound waves also cause the air to ____ and ____.
4. Because sound waves cause air to compress and expand, sound waves are also called ____ waves.
5. Its useful to refer to sound waves as pressure waves because we can build devices which detect changes in ____.
6. A ____ uses a diaphragm stretched over a sealed compartment, and as sound waves move by they create higher and lower ____.
7. As a microphone created differences in pressure, the ____ moves back and forth, which electronics then translate into ____ data.
8. Our eardrums work in the same way, as ____ waves pass through, they make our eardrums ____. Our brain then interprets those vibrations as ____.
9. ____ can be high or low, and it corresponds to the ____ of the wave.
10. Air that is vibrating more times per second has a ____ pitch.
11. Humans hear sound best when ____ per second are between ____ per second and ____ per second
12. As people get older, they start to lose the potential to hear ____ -pitched sounds.

13. Some companies take advantage of the fact in question 14, to have a building emit a high-pitched noise that people over the age of ____ can't hear. Therefore, kids and teens will be annoyed, and won't hang out near the building.
14. ____ sounds are too high in pitch for humans to hear, and sounds that are too low are called ____.
15. Dog whistles use an ___ pitch that is too high for humans to hear.
16. Elephant use infrasonic calls which can be ____ several kilometers away.
17. There also a range of sound wave ____ that humans can comfortably hear.
18. Sounds below 1 ____ per square meter, sounds are too soft for humans to detect.
19. Sounds above 1 ____ per meter tend to hurt our ears.
20. Loudness - A soundwave needs to have ____ times the intensity to sound twice as loud.
21. To measure sound, we use units called ____ , where every notch on the scale is ____ times higher than the previous notch. A decibel is a __tenth__ of a Bel.
22. SKIP 6:39 to 7:30
23. The Doppler Effect is as the source of a sound moves ____ you the pitch of the sound increases, and as the source of a sound moves away the pitch ____. So, as an ambulance moves toward you,you hear a ____ pitched sound.
24. Big Bang Theory Doppler Effect Montage Sheldon was NOT dressed as a ____.



Doppler Effect - an increase (or decrease) in the frequency of sound, light, or other waves as the source and observer move toward (or away from) each other. The effect causes the sudden change in pitch noticeable in a passing siren.

8.3 - Sound Waves (text)

1. All sound waves begin with a ____.
2. Sound waves are ____ - they travel in the same direction as the vibrations.
3. Give one example of sound absorption.
    a.
4. List the factors which affect the speed of sound.
    a.
    b.
    c.
    d.

5. TRUE / FALSE - Solids are less compressible than liquids, and liquids are less compressible than gasses. Therefore sound waves travel fastest in solids and slowest in gasses.
6. TRUE / FALSE - Sound waves travel slower in metal than pudding, because metal is stiffer.
7. TRUE / FALSE - For metal, an increase in temperature reduces stiffness, so sound speed increases.
8. TRUE / FALSE - For fluids, such as air, the increase in temperature reduces density, so the sound speed generally increases.

8.2 - Wave Interactions (text)

1. Define reflection.
    a.
2. Define refraction.
    a.
3. Define absorption.
    a.
4. Define diffraction.
    a.
5. Define absorption.
    a.
6. Define transmitted.
    a.
7. Define medium.
    a.
8. Define wave interference.
    a.
9. Define resonance.
    a.

3/24/23 TEST 8.1-8.16 Wave Properties

8.16 Answer the following PHET questions here, on your Class Doc.

Example Seismic waves earthquake 2 min.

1. Add a link to you **7Waves** Doc below, make the link show as Your 7 Waves Doc Name (7Waves name)
    a.
2. PHET Sound - Describe what happens to the particles and waves when you set Frequency at Max, then slide Amplitude higher and lower? Describe any difference(s) between Min & Max (left & right).
    a.
3. PHET Sound - Describe what happens to the particles and waves when you set Amplitude at Max, then slide Frequency higher and lower? Describe any difference(s) between Min & Max (left & right).
    a.
4. PHET Light - Describe what do you SEE & HEAR when you set Frequency at PURPLE, then slide Amplitude higher and lower? Describe any difference(s) between Min & Max (left & right).
    a.
5. PHET Light - Describe what do you SEE & HEAR when you set Frequency at RED, then slide Amplitude higher then lower? Describe any difference(s) between Min & Max (left & right).
    a.
6. PHET Light - Describe what do you SEE & HEAR when you set Frequency at RED, then slide Amplitude higher then lower? Describe any difference(s) between Min & Max (left & right).
    a.
7. Define AMPLITUDE.

a.

8. Define FREQUENCY.
    a.
9. Define WAVELENGTH.
    a.

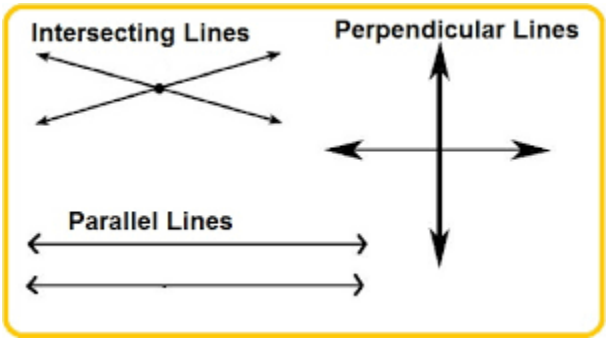
8.15 - 7Waves

1. Click Link Above
2. File > Make a copy
3. ReName
    a. Delete "Copy of"
    b. Add Your Name at end
    c. SHARE with dgruis as EDITOR
4. Add Link to Your 7Waves Doc to Your Doc >>> 7Waves Your Name

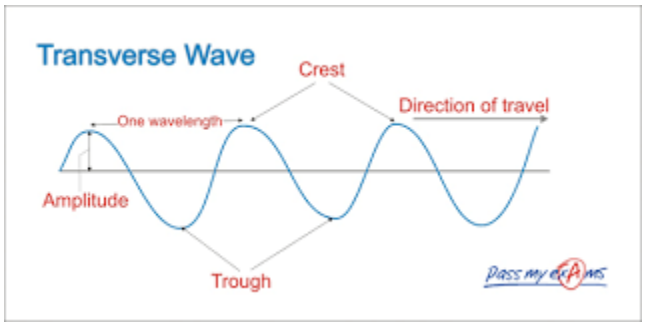
8.11 - Wave Properties

Bill Nye The Science Guy Waves (watched in class 29 min.)

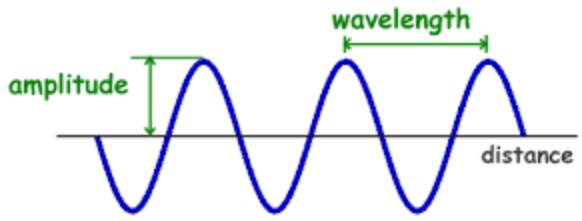
1. TRUE / FALSE - People think in waves.
2. TRUE / FALSE - Waves can carry energy.
3. TRUE / FALSE - Waves in a guitar string create waves in the air.
4. What is a tsunameter?
    a.
5. Perpendicular means ___.
    a.
6. Parallel means ___.
    a.



7. A transverse wave travels ____ to the direction of the source's motion



8. Draw and describe amplitude?
    a.



9. Combinations of transverse waves and longitudinal waves are called _____.
10. _____ is the distance between two corresponding parts of a wave i.e. crest to crest
11. The distance of waves trough to trough is called _____.
12. ___ is the number of complete waves that pass through a given point in a certain amount of time. I.e. per second
13. Wave Speed = Wavelength X _____
14. Waves transmit _____ from place to place.
15. A rock is dropped from 2' above the water, then dropped again from 4' above the water.
16. Examples of longitudinal waves include:
    a.
    b.
    c.
17. At Ready.iowa.gov describe the New Madrid Seismic Zone.
    a.
18. Below, insert an image of the New Madrid Seismic Zone.

19. Describe AMPLITUDE.
    a.
20. Describe FREQUENCY.
    a.
21. Describe WAVELENGTH.
    a.

8.0 - Waves & Electromagnetic Radiation

8.1 - Wave Properties

Quiz Us: Write 10 questions with answers from this chapter:

Example: 1 + 1 = ? (2)

1.

2.

3.
4.
5.
6.
7.
8.
9.
10.

7.16 - Human Impact on the Environment Paper

1. Below write a 5 paragraph essay which summarizes the impact of humans on the environment.
2. Include at least TEN FACTS from your Doc to provide valid and reliable evidence.
3. (Number) and yellow-highlight each quote:
    a. In math class I learned that 1 + 1 = 2 (1), and 1 + 2 = 3 (2).
4. Include and describe
    a. Point Source
    b. Non-point Source
5. Be sure your paragraphs are RED TEXT
6. Insert relevant TWO MAGES.

PLAY Rags to Riches - 7Sci Human Impacts on the Environment

7.4 - Water Pollution

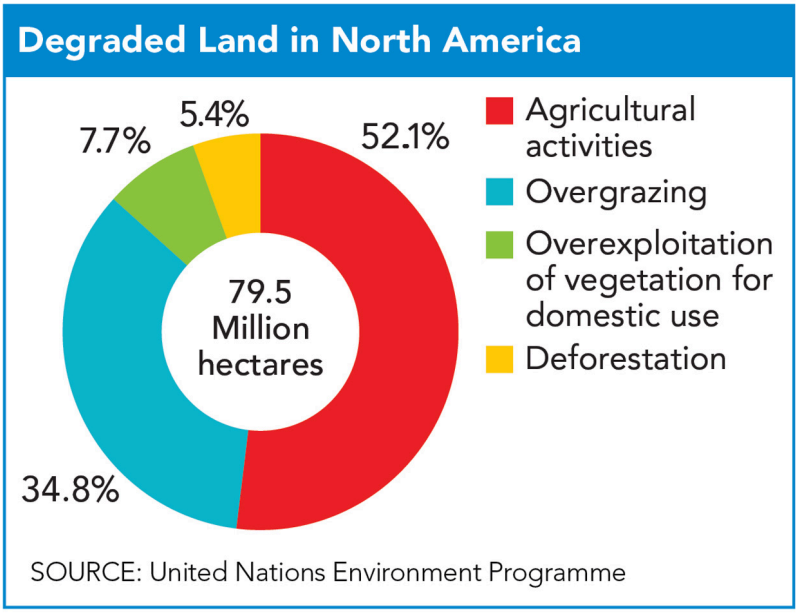
1. Fresh, drinkable water makes up less than ____ % of Earth's water.
2. An area faces water scarcity when the water supply is less than ____ cubic meters per person. (or 264,172 gallons per person)
3. List 3 sources of freshwater pollution:
    a.
    b.
    c.
4. The Deepwater Horizon disaster in 2010, polluted the ocean with ____ million gallons of crude oil. (And, it is still leaking)
5. Give one example of "Going Green".
    a.

7.3 - Impacts On land (Text)

1. Define Renewable.
    a.
2. Define Nonrenewable.
    a.
3. Describe Topsoil.
    a.
4. List the layers that make up fertile soil.

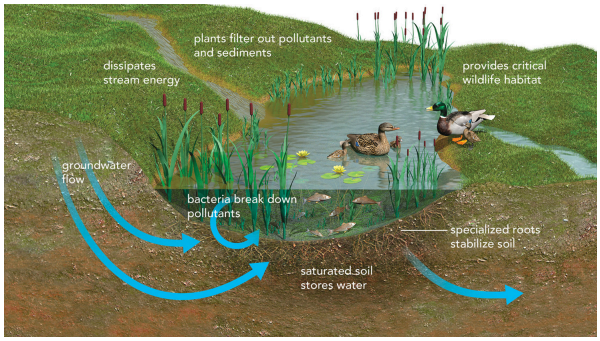
a.
b.
c.
d.

5. Describe soil erosion.
    a.
6. Describe desertification.
    a.



7. Once a landfill is full it is covered with soil heavy in clay. Why do we cap landfills with clay?
    a.
8. List two roles that wetlands play in the environment.
    a.

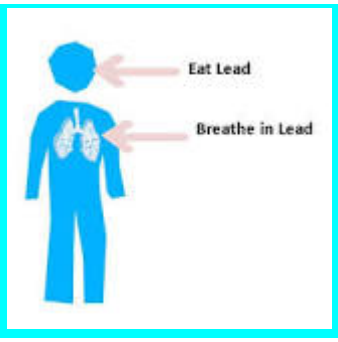
b.



9. As a logging method, ____ cutting is faster and less expensive, but without the protection of trees soil erodes more easily and animal habitats are destroyed.

10. As a logging method, ____ cutting removes only selected trees, and leaves more protection for animals and the soil
11. What natural resources are obtained from Earth's geosphere?
    a.
12. Why are natural resources on land so important to Earth's systems?
    a.
13. How do human activities positively and negatively affect land resources?
    a.

LEAD Pollution



The legacy of the Flint water crisis
(start @ 2:50 min. - 13 min.)

Exposure to lead in ADULTS causes nerve damage to the sense organs and nerves controlling the body. increased blood pressure. hearing and vision impairment. reproductive problems.

Exposure to lead can seriously harm a CHILD's health, including damage to the brain and nervous system, slowed growth and development, learning and behavior problems, and hearing and speech problems.

Homes built in the U.S. before 1978 are likely to have some lead-based paint. When the paint peels and cracks, it makes lead paint chips and dust.

1. Describe the recent lead problem in Flint, Michigan.
   a.
2. What did General Motors (Chevrolet, GMC, Buick) notice about the water?
   a.

7.2 - Air Pollution (Text)

1. Describe **point source** pollution.
    a.
2. Describe **non-point source** pollution.
    a.
3. Describe temperature inversion.
    a.
4. List one effect of Acid Rain.
    a.
5. List one example of efforts to control air pollution.
    a.
6. Describe the Ozone Hole.
    a.
7. What are the causes of air pollution?
    a.
8. What are the long-term negative impacts of air pollution?
    a.
9. What efforts are being made to decrease the levels of air pollution around the world?
    a.

7.16 - Human Impact on the Environment Paper

1. Below write a 5 paragraph essay which summaries the impact of humans on the environment.
2. Utilize quotes from the 8 Billion Angels Questions to provide valid and reliable evidence for your writing.

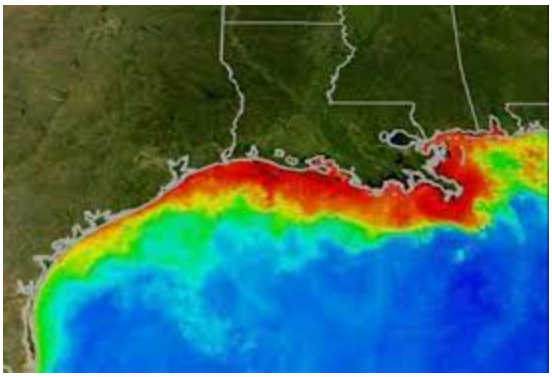
7.15 - 8 Billion Angels

Restart @ 30:00

Human Population's Impact on the Environment

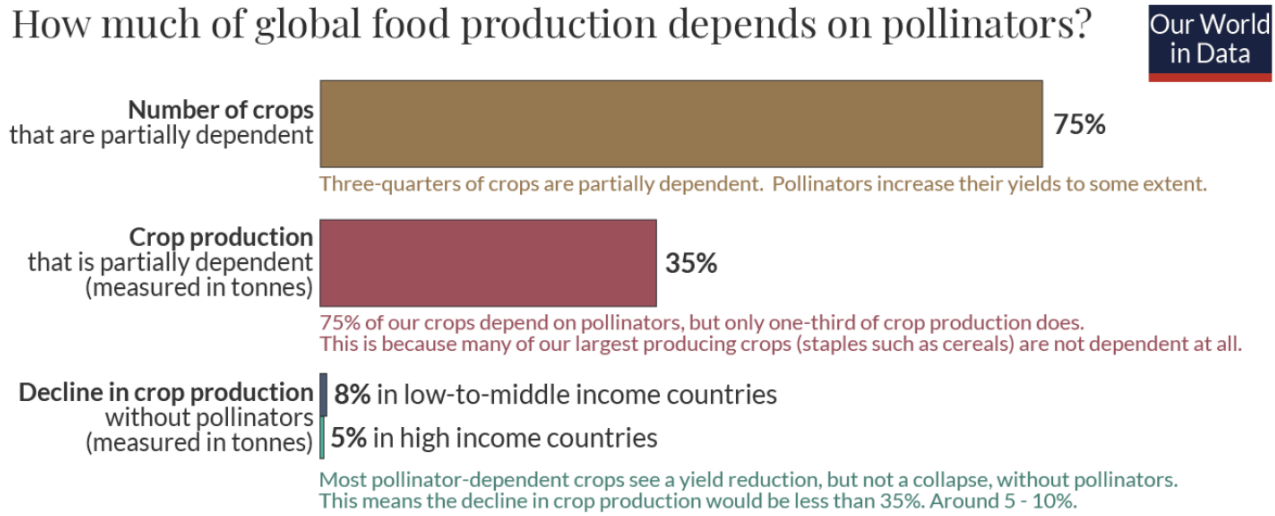
Oceans (3:13-21:00)

- Ocean _A_____ from increased CO_2 dissolved in oceans
- Pollution - Each year, humans produce tons of ____ that ends up in the oceans.
- *The Washington Post* has reported that by 2050, by weight, there will be more plastic in the ocean than ____.
- Oceans receive chemical discharges from boats, planes, cars, trucks, factories, raw sewage, stormwater and pollutants. This run-off causes massive ____ zones where aquatic life is either poisoned by toxic bacteria or suffocates from a lack of oxygen in the water.



Land (21:00)

- The Kansas farmer of 30,000 acres said, ***"I don't know, is water just like ____? There is only a finite amount of oil in the ground, and when it's consumed, it's gone. We are using water faster than the water cycle can replace it. Am I using a limited resource that should be saved for future generations?"***
- In the drive to achieve higher and higher yields, soils across the world have been ____ and stripped of their nutrients.
- Bill Stowe, Des Moines Water Works (34:49) said, ***"Half of our ____ goes to ethanol production. Here in Central Iowa, water __quantity__ is of little concern, but water quality is a huge concern. We have 3 million people living in our state, but we have ____ millions hogs living in it."***
- Bill Stowe added, ***"Iowa produces more corn, ____ and hogs than any other state."***
- Large amounts of artificial fertilizer, made with nonrenewable _f___ _f____ provide the much-needed nutrients to grow our food and boost crop production.
- ____ are a vital chain in the web of life because they provide food for birds and other animals.
-



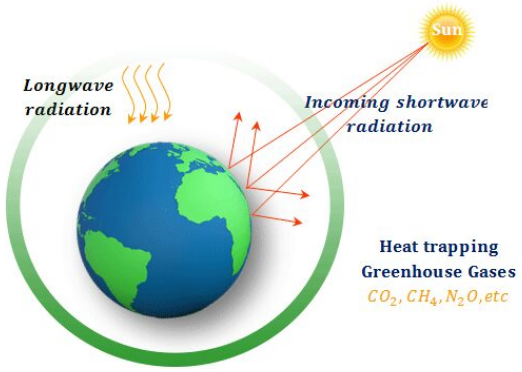
- Because the generous use of water can triple a crop's production, ____, wells, rivers and lakes across the world are being depleted at alarming rates.
- As we add 80 million people to the planet every year, we continue to cut down ____ and destroy wild plant and animal life at alarming rates.
- Cleveland, Ohio's burning river
- Australian politician sets river on fire to protest fracking

Rivers & Air (39:44 /air 39:44/ rivers 41:10)

- In Dehi, India, ____ people die every year because of air quality issues.

- _____ pollution is a result of many different activities, from burning cropland to make way for a new field, to cooking food, to burning coal to stay warm, to generating electricity in coal power plants and exhaust from all of the trucks and cars on the road.
- The **"Tragedy of the ____"** is a term describing what can happen with a ____ natural resource like air, fresh water and fish when people act in their own self-interest and ignore what's best for the whole group. Examples of tragedy of the commons:
    - Depleting water in the ____;
    - Polluting the rivers and the ____;
    - Polluting the ____ from operating a motor vehicle or other activity burning fossil fuel;
    - Fouling the waters by dumping ____ onto the streets or into streams, rivers and oceans

Climate Change

- Each person on the planet emits an average of approximately 5 tons of ____ annually into the atmosphere.
    - People in developed nations like the U___ S____ emit as much as 16-20 tons of CO_2 per year
    - People in underdeveloped nations emit ____ than a ton of CO_2 per year
- **Greenhouse Effect Dangers:** A 2017 study (Wynes, Nicholas) of the relationship between population growth and climate change found **having one less ____ ,** in the developed world, is 9 times more powerful than other efforts in reducing CO_2 emissions which add to the greenhouse effect.
- 

Population & Social Justice (51:00)

- A child born in a developed country consumes far more over their lifetime than a child born in an ____ nation.
- Many developed countries like the United States may have ____ fertility rates, but they still have one of the largest ecological footprints per person.

Girls Education, Family Planning and the Environment

- Securing both education and family planning for all girls and women could mean 1 billion ____ people by mid century.
- High-quality family planning around the world would have powerful positive impacts on the health, welfare, and life expectancy of both women and their children.
    - Some cultures are still dominated by male patriarchy where the man determines how many children his partner will have and when.
    - Early marriages for girls as young as 15 years old are also common in certain cultures.
    - Some cultures encourage large numbers of children.

Consumption vs. Population

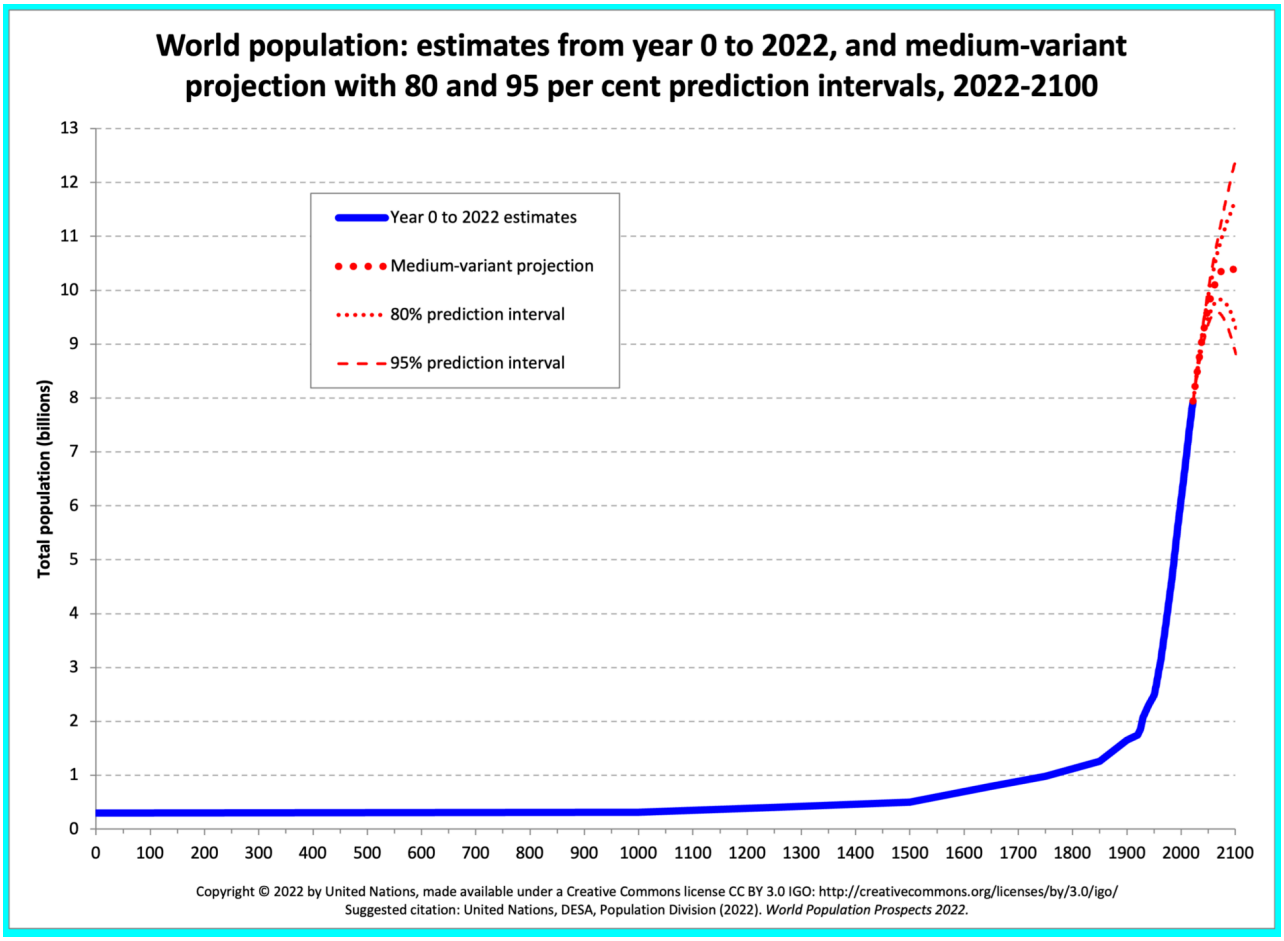
- **The Magnitude of the Problem:** Assessments, environmental scientists and economists all concur that global consumption or economic activity needs to be reduced by ____ if we are going to live sustainably and allow for the abundance and diversity of life to flourish alongside us.

- World Bank data for the past 57 years shows that global economy ____ is far from slowing down and has grown on average at an annual rate of 4%; the exact ____ direction needed to achieve sustainability.

Solutions - As individuals, we can:

- **Educate ourselves** about the connection between ____ and the environment.
- Recognize that world emergencies are occurring with greater frequency and severity:
  - food,
  - water,
  - energy,
  - pollution,
  - climate
  - species extinction
- **CONSERVE - Use resources less wastefully**
  - Example: Take showers which are NOT longer than needed for cleanliness
  - **OTHER**
    - ?
    - ?

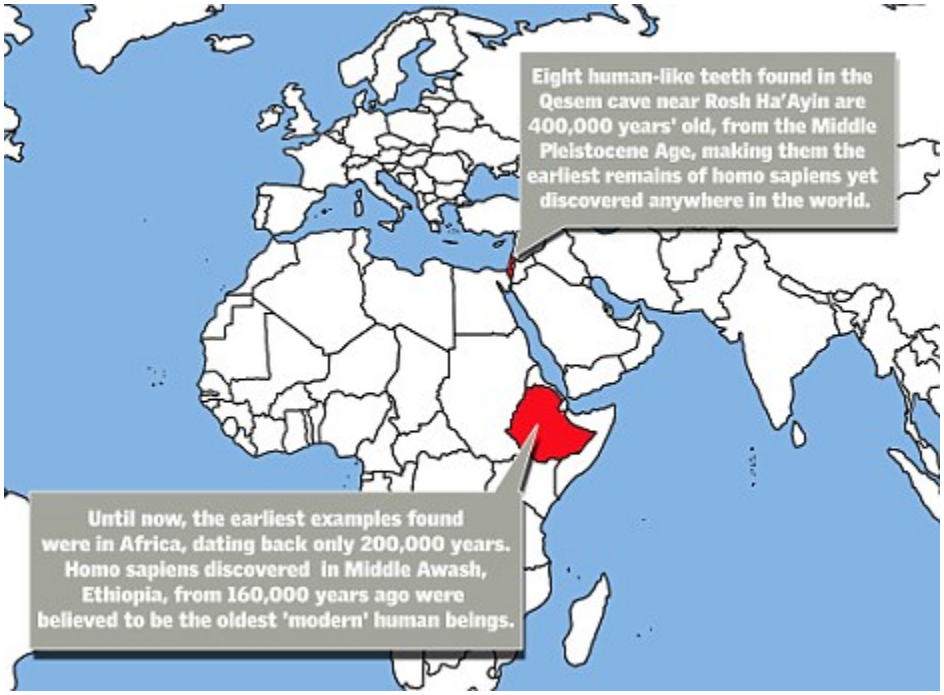
7.1 - Population Growth and Resource Consumption (Text)



1. Analyze the chart above, describe the trendline of world population growth from year 0 to 1300.

a.

2. Analyze the chart above, describe the trendline of world population growth since approximately 1950.
    a.
3. Why do you think the human population has changed so dramatically since 1950?
    a.
4. How is the consumption of natural resources by humans affected by changes in population size?
    a.
5. World population remained daily constant until about 10,000 years ago. What happened about 10,000 years ago to give rise to steady, long-term world population growth?
    a.
6. Describe ‘exponential growth’.
    a.
7. Describe why ‘energy’ is becoming more important to human survival than it may have been 10,000 years ago.
    a.



8. Look at the image above. Describe what it means if someone says, “ We are all African.”
    a.
9. Humans dig or mine to access fossil fuels, but we also dig or mine to access minerals used to create solar panels and wind turbines to create electricity. Describe the long term impact of using fossil fuels to create electricity vs. using solar panels and wind turbines to create electricity.
    a.
10. Describe the point at which humans reach the point of overpopulation.
    a.

7.0 - Human Impacts on the Environment (Text)

1. When you wash your hands in the school restroom, how many paper towels do you use?
    a.
2. Describe how you can reduce the number of paper towels you use in school.
    a.
3. Describe what happens with food scraps from the school cafeteria.
    a.
4. How can you help your school reduce its impact on Earth's systems?
    a.
5. The need for agricultural land and lumber grows each year. What do you think is the cause of this continued demand?
    a.
6. EPA stands for
    a.
7. In 2014, Americans recycled only ____% of their waste.
8. **STEM Phenomenon:** The ocean is full of ____, and one area is known as the Great Pacific ____ Patch.
9. A lot of plastic in the oceans comes from our ____ systems.
10. Each of us can make a difference by following the three R's: ___, ____, and ____.
11. How does human activity impact Earth's systems?
    a.

6.43 - pH Tastes Wonder Lab: Bromothymol Blue | Discovery Place Science

- pH is a measure of how acidic or basic a substance or solution is
    - ACIDS taste SOUR
        - pH 0-7.0
    - BASES taste BITTER, feel soapy
        - pH 7.1-14

6.42 - 7Sci Freshwater Resources Quiz Tuesday, Feb. 21

Definition	Term
The degree of purity of water, determined by measuring the substances in water, besides water molecules.	WATER QUALITY
How acidic or basic a substance is, measured on a scale of 1 (very acidic) to 14 (very basic).	pH
The level of the minerals calcium and magnesium in water.	Hardness
The amount of one substance in a certain volume of another substance.	Concentration
The process of passing water through a series of screens that allow the water through, but not larger solid particles.	Filtration
Sticky globs created by adding a chemical such as alum during water treatment.	FLOCS - iSearch FLOCS image

	
Water containing human waste.	Sewage
Deposits of fine solids that settle out from wastewater during the treatment process.	Sludge
An underground tank containing bacteria that treats wastewater as it passes through.	Septic Tank
The ground area around a septic tank through which wastewater filters after leaving the tank.	Leach Field
A water shortage caused by long periods of low precipitation in a particular area.	Drought
The process of using a resource wisely so it will not be used up.	Conservation
The process of obtaining fresh water from salt water by removing the salt.	Desalination
The addition of any substance that has a negative effect on water or the living things that depend on the water.	Water Pollution
Rain that is more acidic than normal, caused by the release of molecules of sulfur dioxide and nitrogen oxide into the air.	Acid Rain
A chemical intended to kill insects and other organisms that damage crops.	Pesticide
Electricity produced by the kinetic energy of water moving over a waterfall or dam.	Hydroelectric Power

6.41 - Deep Water Horizon Oil Drilling Accident

The Deepwater Horizon oil rig exploded on April 20, 2010, killing 11 people and spewing more than 200 million gallons of oil into the Gulf of Mexico.

1. True / False - The oil is pumped from miles under the Earth's crust.
2. Describe what the daughter meant when she said, "That oil is a monster."
   a.
3. Describe what happened with the metal tube that the daughter stuck in the pop can.
   a.
4. The daughter added, "For over _____ million years the dinosaurs have been getting squeezed tighter and tighter because they have miles of earth and ocean _____ down on them.

5. Describe the basic steps of how oil is formed.
    a.
6. The energy in fossil fuels originally came from the _____.
7. The daughter said, “My dad and his friends set up a big machine on the ocean floor called a _____ preventer.”
8. The helicopter flight to the Deep Water Horizon was ____ minutes.
9. The Deep Water Horizon was - a boat // a structure on stilts.
10. How many feet deep was the cement supposed to be _____ feet deep. (A football field is 360 feet long.)
11. They said the negative pressure test should start at ____ psi and end at ____ psi.
12. PSI stands for: ____ per __Square__ ____
13. They said 1,395 psi is enough force to cut your _____.
14. The Deep Water Horizon received BP’s Highest _____ Award for the seventh straight year.
15. The Bankston (boat) was a boat to reclaim the ____ , after the oil pipe was successfully tested.
16. The EDS button was a____ Disconnect System, to cut the boat away from dangerous (deadly) pressure blasts.
17. True / False - *iSearch* - The Deep Water Horizon is still leaking oil into the ocean.
18. True / False - Minerals can be destroyed by heat, air, acid, or mixing.
19. True / False - Fossil fuels can be destroyed by heat, air, acid, or mixing.
20. True / False - Iowa had quite a bit of coal, so much of Iowa was once under water. ***(drag the image larger to view the KEY in the lower-right corner)***

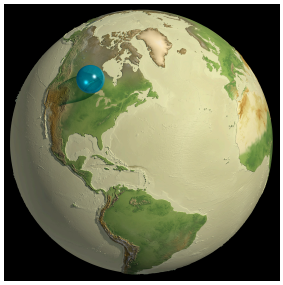
    a. 

[Deepwater Horizon 10 Years Later] << **CTRL-F** to search this site and quickly find these answers.

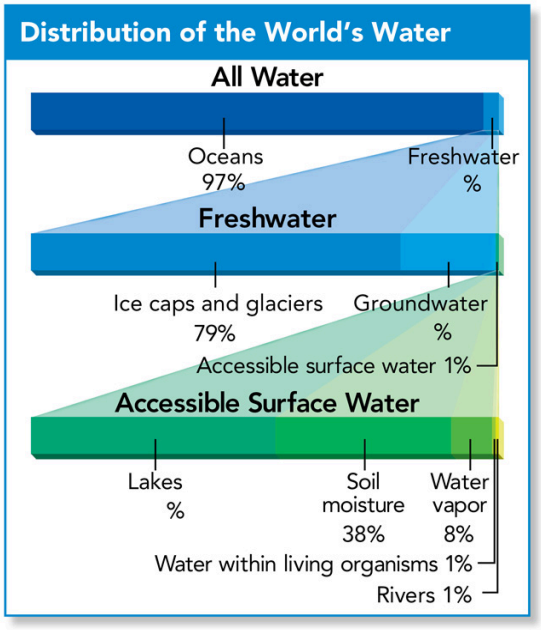
21. The Deepwater Horizon spill released ____ million gallons of oil, or ____ million barrels of oil, into the Gulf of Mexico?
22. It oiled ____ miles of ocean shoreline in ____ states.
23. NOAA responds to more than ____ oil spills every year.
24. Over the past decade, NOAA has made significant ____ in oil spill detection, modeling, understanding oil toxicity, data management, and methods to assess protected species.
25. In 2016, BP was found responsible for the 2010 Deepwater Horizon oil spill and will pay more than ____ dollars in civil and criminal penalties, with a substantial portion of these funds directed toward restoration of Gulf resources
26. **NOAA Fisheries** stands for: **National _____ and Atmospheric Agency Fisheries**

6.4 - Water Resources Notes

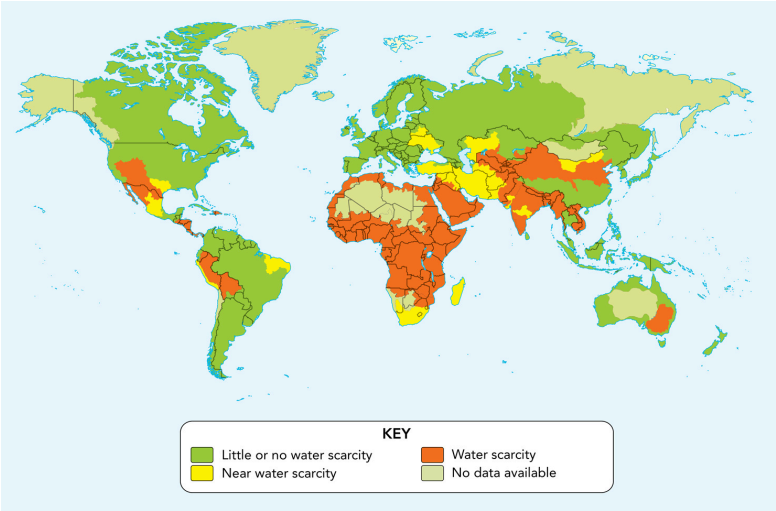
If all of the water on earth were collected, it would form a sphere 860 miles across!



1. Water on Earth - Though Earth is known as the ____-planet, the water that living things rely on represents only a fraction of the planet's total water supply.
    a. Most water on Earth is ____ water
    b. ____ water is only found as surface ice or water, or within the Earth's crust as groundwater (aquifers).
        i. Most of the freshwater on Earth is locked up as ice at the poles and in glaciers
2. ____ Water - 1) moisture on top of soil; 2) frozen as permafrost; 3 lakes, rivers, streams, swamps
    a. Most surface water is found in lakes. Lakes formed through various ____ processes when water fills in depressions.
    b.



3. Ground Water is NOT evenly ____ across Earth. Some rocks are more porous than others, or have more empty spaces in which water can collect.
    a. Groundwater may take hundreds, thousands or millions of years to ____, especially in arid regions where there is little rainfall or surface water to supply the aquifer.
4. Human Impacts - As more water is removed from ____, water shortages can occur. Pollution of groundwater can negatively impact the amount of available fresh water.
5.



6. Desalination - removes ____ and minerals from water, and it typically very expensive

7. Ocean Water - humans use sea organisms for ____, salt, minerals and fuels
    a. Overfishing negatively impacts a fish ____ ability to maintain normal levels
    b. Pollution - can damage sea organisms
    c. Carbon ____ dissolves into ocean water creating carbonic acid, which has made it more difficult for some shellfish to produce shells which are essentially calcium carbonate (a base).

Renewable and Nonrenewable Quiz RETAKE 2/2/23

6.3 Mineral Resources Notes DUE FEB. 2-3

- Minerals - _____ materials NOT LIVING - rocks, graphite (called lead) in pencils, in computers, cell phones other electronics
    - ORGANIC = ____
    - ____ = NOT LIVING
        - Example - Our skeletons are living materials which are partially composed of minerals like calcium; sea shells are calcium carbonate; chalk is calcium carbonate
- Solution - water containing dissolved ____
    - Sometimes elements in solutions ____ when water evaporates
- Magma and Lava - semi-molten rock
- Distribution of Minerals depends how and when the minerals form
    - ____ is rare because it is a heavy metal and sank toward Earth's core
- Humans & Minerals
    - cars, buildings, electronics, jewelry, etc.

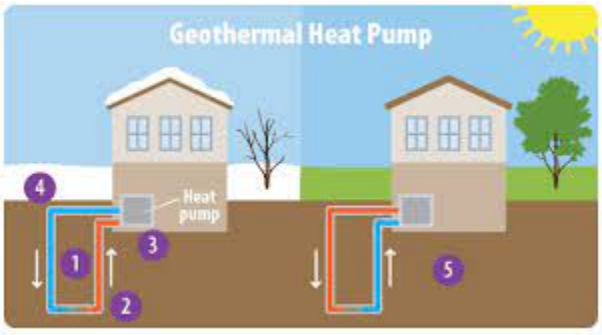
Quiz 1/26/23 **6.22 Renewable vs Nonrenewable Quiz**

- **After quiz play**
    - **Solar Energy Coins &**
    - **Force & Energy Coins**

6.21 REVIEW - Renewable vs. Nonrenewable Energy Matching << link

6.2 Renewable Energy Notes

- Abundance of fossil fuels has made it easy for humans to justify using petroleum, coal and natural gas
- Alternative or ____ Sources of ____
    - Solar

- 
- Hydroelectric - Hoover Dam
- 
- Wind - in 2019, 41% of Iowa's electricity was produced by wind (Iowa Utilities Board)
- 
- Geothermal
- 

  - < 50 Degrees Year Round
    - Geothermal _____/ ____ can be utilized almost anywhere
    - Geothermal ____ production must be over a geothermal hot spot (near volcanoes)

6.1 Nonrenewable Energy Sources Notes

- Natural resource - anything occurring ____ that people use
    - Renewable resource - can be replenished in our ____
        - Sunlight
        - Trees
        - Nuclear Energy
            - provides 20% of the electricity in the U.S.
            - 70% of world's ____ is located in only 5 countries (Australia 29%)
    - Nonrenewable - ____ be replaced in our lifetime
        - Fossil fuels - oil, coal, natural gas
    - Pollution - Humans are burning fossil fuels at a faster rate than plants can naturally ____ carbon dioxide
    - World Politics- numerous ____ are connected to access to fossil fuels

#3 - iSearch and answer below, why do some countries eat insects?

-

#2 - Interstellar Question

Distribution of Natural Resources

1 NRE

#1.1 NRE Terminology

1. What is a natural resource?
    a.
2. What do 'finite' & 'infinite' mean?
    a. Finite =
    b. Infinite =
3. What are nonrenewable resources?
    a.
4. What factors affect the distribution of nonrenewable energy resources?
    a.
5. TRUE / FALSE - Human activity impacts the distribution of fossil fuels.
    a.

#1.2 - NRE Connect Lab in the table below

Working in pairs - - Almost everything you do involves using resources. Many of the resources you use have a limited supply (infinite not infinite). What would happen if we used up the materials in all available locations?

1. **CLASSIFY - In the 2nd column, list 10 resources you use in a typical day. In the 3rd column, classify (yellow-highlight) each as NR or R (Nonrenewable or Renewable).**

1.		**NR / R**
2.		**NR / R**
3.		**NR / R**

4.		NR / R
5.		NR / R
6.		NR / R
7.		NR / R
8.		NR / R
9.		NR / R
10.		NR / R

a. iSearch, and list 5 materials utilized to manufacture a CELL PHONE

1.		NR / R
2.		NR / R
3.		NR / R
4.		NR / R
5.		NR / R

2. **INFER - As a team (2-3), iSearh, discuss, estimate, record what two resources are used in the largest quantity to manufacture cell phones.** (Include the URL used in parenthesis after each)
    a.
    b.
3. **RELATE CAUSE and EFFECT - Look at your 2nd table, and select one resource. Do you think this resource is replaceable over your lifetime?**
    a. **Resource = _____**
    b. **Replaceable in Your Lifetime - YES / NO (yellow-highlight your answer)**
4. **CONSTRUCT an EXPLANATION - A period of unusually hot, dry weather comes to a town that is dependent on a small reservoir of fresh drinking water. As the dry weather continues, the town continues to use only as much water as it used in the past, but the reservoir dries up. Construct an explanation describing why the reservoir dried up. (Hint: Recall what you know about the water cycle.**
    a. **EXPLANATION -**
5. **PROACTIVE - Proactively, create a list of actions people could have taken before the drought, as a part of their normal, day-to-day water use.**
    a. **List of Actions the people could have taken in advance to be PROACTIVE.**
        i.
        ii.
        iii.
        iv.

b. **List of actions YOU can take to be PROACTIVE, now and in the future, given that fresh water is anticipated to be a concern in much of the world.**
   i.
   ii.
   iii.
   iv.

#1.3 - Earth is Running Out of Elements: Why? (9 min.)

1. ____ is a key component of LCD panels and touchscreens.
2. Describe why the supply of the answer to #1 is a challenge.
   a.
3. TRUE / FALSE - Rare earth elements are very rare. (yellow-highlight your answer)
4. The rarest of the rare earth elements is ____ times more common than gold.
5. Since rare earth elements are not especially rare, describe why they are classified as rare.
   a.
6. ___ is the only element other than iron that produces a spark when struck.
7. ___ can contain up to 70% cerium and lanthanum, but it can also contain thorium, uranium and radium, which are highly regulated radioactive elements.
8. ___ is used in the process of pressure-treating wood, but it is also poisonous and can cause cancer.
9. Describe 'vulnerability to supply restriction'.
   a.
10. The U.S. produces 73% of the world's ___.
11. Of the 35 most critical elements in the world, ___ produces at least 20 of them.
12. One study found that recovering materials at a ____ plant produced 80% fewer emissions.
13. Describe 'phytomining'.
    a.
14. Describe 'bioleaching'.
    a.
15. Criticality isn't a single, static problem; it's a function of our ability to ___ and ___.

Laboratory Safety #### #### #### #### **Laboratory Safety** #### ####

Safety Symbols

- Lab procedures and equipment may be labeled with safety symbols.
- These symbols warn of specific hazards, such as flames or broken glass. Learn the symbols so you will recognize the dangers. Then learn how to avoid them.
- Many common safety symbols are shown below.

Lab Safety Rules

- Wear shoes that completely cover your feet.
- If your hair is long, tie it back or cover it with a hair net.
- Protect your eyes, skin, and clothing by wearing safety goggles, an apron, and gloves.
- Use hot mitts to handle hot objects.
- Never work in the lab alone.
- Never engage in horseplay in the lab.
- Never eat or drink in the lab.
- Never do experiments without your teacher's approval.
- Always add acid to water, never the other way around, and add the acid slowly to avoid splashing.
- Take care to avoid knocking over Bunsen burners, and keep them away from flammable materials such as paper.
- Use your hand to fan vapors toward your nose rather than smelling substances directly.
- Never point the open end of a test tube toward anyone—including yourself!
- Clean up any spills immediately.

- Dispose of lab wastes according to your teacher's instructions.
- Wash glassware and counters when you finish your work.
- Wash your hands with soap and water before leaving the lab.

Grade 7 | Science Standards

MS-PS2 Motion and Stability: Forces and Interactions

Students who demonstrate understanding can:

MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.

MS-PS2-5. Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

MS-PS3 Energy

MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.

MS-PS3-4. Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.

MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

MS-LS1 From Molecules to Organisms: Structures and Processes

MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

MS-LS1-7. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

MS-LS2 Ecosystems: Interactions, Energy, and Dynamics

MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

MS-LS3 Heredity: Inheritance and Variation of Traits

MS-LS3-1. Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.

MS-ESS1 Earth's Place in the Universe

MS-ESS1-1. Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.

MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.

MS-ETS1 Engineering Design

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

STOP #### STOP #### STOP #### STOP #### STOP #### STOP #### STOP #### STOP
STOP #### STOP #### STOP #### STOP #### STOP #### STOP #### STOP #### STOP

7Sci Interstellar #1

1. Inductive reasoning is the process of drawing general conclusions based on many clues, or pieces of evidence. Many crimes are solved using inductive reasoning. It is also the hallmark of science and the basis of the scientific method. Describing a specific scene in the movie, explain how emotion can interfere with Inductive Reasoning.
    a.
2. Describe a scene where the lack of natural resources appears to be a problem on Earth.
    a.
3. Does the moon have weather? Explain.
    a.

6.24 As Utah's Great Salt Lake Dries Up, Economic Crisis Looms | WSJ (7 min.)
The Mississippi River Is Drying Up, Disrupting a Vital Supply Lane | WSJ (4 min.)
Mississippi River Drought Reveals Horrors Beneath the Surface (2 min.)

1. Why is the Great Salt Lake drying out?
    a.
2. What are the problems associated with the Great Salt Lake drying out? (List several)
    a.
    b.
    c.
3. Describe challenges with the Mississippi river this year (2022/2023).
    a.

#4 - List the basic steps industry uses to make PLASTIC. (add rows as needed)

1.
2.
3.

#1 - Interstellar & Nonrenewable Resources

1. Describe how changes in natural resources on Earth probably impacted Interstellar.
    a.

OTHER ### OTHER ### OTHER

Bison & Plant Diversity (Successful Farming w/ 4 min. Radio article)

Pinterest Nonrenewable & Renewable
Wind Turbine Blade Design
Passive Solar House Design